

WHAT IS CLAIMED IS:

1. A method of simulating movement of a plurality of elements through space, the method comprising the steps of:
 - 5 generating a plurality of 2D grids, each 2D grid having a plurality of grid points;
associating movement information with each 2D grid point;
changing the movement information associated with the 2D grid points over a time period that includes a series of time steps;
 - 10 defining a region of 3D space using the 2D grids; and
advecting the plurality of elements through the region of 3D space using the movement information associated with the 2D grids.
2. A method of advecting elements through space, the
 - 15 method comprising the steps of:
generating a plurality of 2D grids, each 2D grid having a plurality of grid points, each grid point having movement information;
defining a region of 3D space using the 2D grids;
generating a plurality of elements in the region of 3D space, each
20 element having a location; and
for each element, determining movement information for an element based on the location of the element in the region of 3D space, the determining step including:
identifying points on the 2D grids that lie on both sides of
25 the element at the location in the region of 3D space;
determining movement information at the points on the 2D grids; and

interpolating between the movement information at the points on the 2D grids to determine element movement information for the element at the location in 3D space.

5 3. The method of claim 2 wherein the movement information includes a 2D vector.

 4. An apparatus for simulating movement of a plurality of elements through space, the apparatus comprising:
10 means for generating a plurality of 2D grids, each 2D grid having a plurality of grid points;
 means for associating movement information with each 2D grid point;
 means for changing the movement information associated with
15 the 2D grid points of the 2D grids over a time period that includes a series of time steps;
 means for defining a region of 3D space using the 2D grids; and
 means for advecting the plurality of elements through the region of 3D space using the movement information associated with the 2D
20 grids.